INDEX TO VOLUME XXXII

ABRAHAM, M., 210
ALLEN, S. L., 221
Arginase Activity in the Developing Chick Embryo in Relation to Nitrogen Excretion, 197

BARTHOLOMEW, GEORGE A., 230
BELL, ROBERT W., 51
BERNSTEIN, JERALD J., 284
BERRY, MARGARET ANN, 115
BEVELANDER, GERRIT, 40
Body Temperature in the White-footed Mouse, *Peromyscus leucopus noveboracensis*, 90
BOOLOOTIAN, R. A., 213
BULLOCK, THEODORE H., 104

CADE, TOM J., 230
Changes in Activities of Uricase and Xanthine Oxides during Life-Cycle of Japanese Beetle (*Popillia japonica* Newman), 239
Chemical Inhibition of Segment Regeneration in *Eisenia foetida*, 185
COSTLOW, JOHN D., JR., 177

DAWE, ALBERT R., 256
DENENBERG, VICTOR H., 51
DOYLE, M. E. 246
DOYLE, W. L., 246

ECKSTEIN, B., 210
Effect of Carbonic Anhydrase Inhibitors on Shell Development and Growth of *Balanus improvisus* Darwin, 177
Effects of Osmotic Pressure and Sodium Concentration on the Response of Melanophores to Intermedin, The, 15
Effects of Presetting the Membrane Potential of the Soma of Spontaneous and Integrating Ganglion Cells, 104
ELLIS, JOHN F., 29
Experimental Analysis of the Red Chromatophore System of the Prawn *Palaemonetes vulgaris*, 128

Factors Involved in Infection by the Kappa Particles in *Paramecium aurelia*, Syngen 4, 78
FARMANFARMAIAN, A., 213
Fate of Fructose in the Alimentary Canal of the Cockroach, 293
FINGERMAN, MILTON, 128
Formation and Distribution of Esterase in Gammarids, 246

GIESE, A. C., 213
GOLDIE, MARK, 197
Growth and Differentiation of Embryonic Chick Eye in Vitro. II. On Dialyzates of a Yolk-Albumen Extract, 115

HARRISON, JOHN R., 115
Histochemical and Cytological Study of the Calciferous Glands of *Lumbricus terrestris*, A, 40

Interrelation of Queen and Worker Oviposition in *Myrmica*, 63
Intranuclear Co-ordination in *Tetrahymena*, 221

LESLIE, P. H., 151
LOWE, MILDRED E., 128

MCCLEARY, ROBERT A., 284
MASSARO, EDWARD J., 185
Modifications of Activity Rhythm of *Periplaneta americana* (L.), Induced by Carbon Dioxide and Nitrogen, 57
MORRISON, PETER, 90, 256
MUSACCHIA, X. J., 47

NAKAHARA, HIROSHI, 40
NANNEY, D. L., 221
NOVALES, RONALD R., 15

OTANI, TAKUZO, 104

PILLAI, M. K. K., 293
Properties of a Certain Lag Type of Population Growth and the Influence of an External Random Factor on a Number of Such Populations, The, 151

RALPH, CHARLES L., 57
RAPPAPORT, R., 246
Relationships between Social Reactions and Avoidance Conditioning, 51
Reproductive Cycles of Five West Coast Crabs, 213
Respiration of Crabs in Georgia Salt Marshes and Its Relation to Their Ecology, 1
Reversal of an Adenine and a Cytidine Requirement in Axenic *Drosophila* Culture, 29
Role of Light and Darkness in Regulation of Refractory Period in Gonadal and Fat Cycles of Migratory Birds, 160
ROSS, DONALD J., 239
RYSER, FRED A., 90, 256

SANDEEN, MURIEL I., 128
SAXENA, K. N., 293
SCHRANK, A. R., 185

Sea Water and Salt Utilization by Savannah Sparrows, 230
Studies on the Physiology of the Masked Shrew, *Sorex cinereus*, 256
Succinic Dehydrogenase Activity in Estivating and Active Snails (*Helix*) *Levantina hierosolyma*, 210

TALLAN, IRWIN, 78
TEAL, JOHN M., 1
Time-Lapse Photography: A Technique for Studying Diurnal Rhythms, 272
TUCKER, J., 213
Unique Method for Control of Brightness Cues in Study of Color Vision in Fish, A, 284
Viability of *Chrysemys picta* Submerged at Various Temperatures, The, 47

WEIR, J. S., 63
WOLFSON, ALBERT, 160
WOOD-GUSH, D. G. M., 272

Physiological Zoölogy

A QUARTERLY JOURNAL OF ZOÖLOGICAL RESEARCH

THOMAS PARK
Editor
BARBARA P. FISKE
Assistant Editor

EDITORIAL BOARD

L. G. BARTH, Columbia University
F. A. BROWN, JR., Northwestern University
T. H. BULLOCK, University of California
THOMAS BURNETT, Canadian Department of Agriculture
WILLIAM L. DOYLE, University of Chicago
M. F. GUYER, University of Wisconsin
L. V. HEILBRUNN, University of Pennsylvania
F. L. HISAW, Harvard University
JOHN O. HUTCHENS, University of Chicago
W. H. JOHNSON, Wabash College
DOROTHY PRICE, University of Chicago
T. M. SONNEBORN, Indiana University
H. B. STEINBACH, University of Chicago
B. H. WILLIER, Johns Hopkins University

VOLUME XXXII
1959

THE UNIVERSITY OF CHICAGO PRESS
CHICAGO, ILLINOIS

THE CAMBRIDGE UNIVERSITY PRESS, LONDON

PUBLISHED
JANUARY, APRIL, JULY, OCTOBER, 1959
COPYRIGHT 1959 BY THE UNIVERSITY OF CHICAGO

COMPOSED AND PRINTED BY THE UNIVERSITY OF
CHICAGO PRESS, CHICAGO, ILLINOIS, U.S.A.

CONTENTS OF VOLUME XXXII

NUMBER 1

Respiration of Crabs in Ceorgia Salt Marshes and Its Relation to Their Ecology
John M. Teal 1

The Effects of Osmotic Pressure and Sodium Concentration on the Response of Melanophores to Intermedin . . . . . *Ronald R. Novales* 15

Reversal of an Adenine and a Cytidine Requirement in Axenic *Drosophila* Culture
John F. Ellis 29

A Histochemical and Cytological Study of the Calciferous Glands of *Lumbricus terrestris*
Gerrit Bevelander and Hiroshi Nakahara 40

The Viability of *Chrysemys picta* Submerged at Various Temperatures *X. J. Musacchia* 47

Relationships between Social Reactions and Avoidance Conditioning
Victor H. Denenberg and Robert W. Bell 51

Modifications of Activity Rhythm of *Periplaneta americana* (L.), Induced by Carbon Dioxide and Nitrogen . . . . . *Charles L. Ralph* 57

NUMBER 2

Interrelation of Queen and Worker Oviposition in *Myrmica* . . . . . *J. S. Weir* 63

Factors Involved in Infection by the Kappa Particles in *Paramecium aurelia*, Syngen 4
Irwin Tallan 78

Body Temperature in the White-footed Mouse, *Peromyscus leucopus noveboracensis*
Peter Morrison and Fred A. Ryser 90

Effects of Presetting the Membrane Potential of the Soma of Spontaneous and Integrating Ganglion Cells . . . . . *Takuzo Otani and Theodore H. Bullock* 104

Growth and Differentiation of Embryonic Chick Eye in Vitro. II. On Dialyzates of a Yolk-Albumin Extract . . . . . *John R. Harrison and Margaret Ann Perry* 115

Experimental Analysis of the Red Chromatophore System of the Prawn *Palaemonetes vulgaris*
Milton Fingerman, Muriel I. Sandeen, and Mildred E. Lowe 128

NUMBER 3

The Properties of a Certain Lag Type of Population Crowth and the Influence of an External Random Factor on a Number of Such Populations . . . . . *P. H. Leslie* 151

Role of Light and Darkness in Regulation of Refractory Period in Conadal and Fat Cycles of Migratory Birds . . . . . *Albert Wolfson* 160

Effect of Carbonic Anhydrase Inhibitors on Shell Development and Growth of *Balanus improvisus* Darwin . . . . . *John D. Costlow, Jr.* 177

Chemical Inhibition of Segment Regeneration in *Eisenia foetida*
Edward J. Massaro and A. R. Schrank 185

Arginase Activity in the Developing Chick Embryo in Relation to Nitrogen Excretion
Mark Goldie 197

Succinic Dehydrogenase Activity in Estivating and Active Snails (*Helix*) *Levantina hierosolyma* . . . . . *B. Eckstein and M. Abraham* 210

NUMBER 4

Reproductive Cycles of Five West Coast Crabs
R. A. Boolootian, A. C. Giese, A. Farmanfarmaian, and J. Tucker 213

Intranuclear Co-ordination in *Tetrahymena* . . . . . *D. L. Nanney and S. L. Allen* 221

Sea-Water and Salt Utilization by Savannah Sparrows
Tom J. Cade and George A. Bartholomew 230

Changes in Activities of Uricase and Xanthine Oxidase during Life-Cycle of Japanese Beetle (*Popillia japonica* Newman) . . . . . *Donald J. Ross* 239

Formation and Distribution of Esterase in Gammarids
W. L. Doyle, R. Rappaport, and M. E. Doyle 246

Studies on the Physiology of the Masked Shrew *Sorex cinereus*
Peter Morrison, Fred A. Ryser, and Albert R. Dawe 256

Time-Lapse Photography: A Technique for Studying Diurnal Rhythms
D. G. M. Wood-Gush 272

A Unique Method for Control of Brightness Cues in Study of Color Vision in Fish
Robert A. McCleary and Jerald J. Bernstein 284

Fate of Fructose in the Alimentary Canal of the Cockroach
M. K. K. Pillai and K. N. Saxena 293